ITEM 403.1335M RUT AVOIDANCE ASPHALT CONCRETE, TYPE 3 RA
ITEM 403.1735M RUT AVOIDANCE ASPHALT CONCRETE, TYPE 6F RA
ITEM 403.1935M RUT AVOIDANCE ASPHALT CONCRETE, TYPE 7F RA

The requirements of Section 403 - Hot Mix Asphalt Concrete Pavement of the Standard Specifications of January 2, 1995 shall apply except as modified and/or revised below:

DESCRIPTION

This work shall consist of constructing rut avoidance asphalt concrete pavement courses in accordance with these specifications and in reasonable close conformity with the required lines, grades, thicknesses, and typical sections shown on the plans or established by the ENGINEER.

MATERIALS

The materials and composition for these mixtures shall meet the requirements specified for Type 3 binder course, Type 6F and Type 7F top course in Subsection 401-2.01 through 401-2.05, except as noted herein.

The CONTRACTOR shall formulate and submit to the Project ENGINEER, a job mix formula that satisfies the design general limits listed in Table 1 - Rut Avoidance Mix Composition. The production tolerances in Table 1 will be permitted to exceed the design general limits.

	BINDER		TOP			
	TYPE 3 RA		TYPE 6F RA		TYPE 7F RA	
SCREEN SIZE	DESIGN GENERAL LIMITS % PASSING	PRODUCTION TOL. %	DESIGN GENERAL LIMITS % PASSING	PRODUCTION TO. %	DESIGN GENERAL LIMITS % PASSING	PRODUCTION TOL. %
37.5 mm	100	--				
25.0 mm	95-100	--	--			
19.0 mm	74-93	±5	100	--	--	
12.5 mm	58-73	±5	95-100	--	100	--
6.3 mm	38-53	±5	58-72	±5	90-100	--
3.2 mm	26-40	±4	36-54	±4	45-70	±4
850 µm	9-23	±4	15-32	±4	15-40	±4
425 µm	4-18	±4	8-25	±4	8-27	±4
180 µm	3-13	±3	4-16	±3	4-16	±3
75 µm	2-6	±2	2-6	±2	2-6	±2
%	4.0-6.0	--	5.0-6.2	--	5.2-7.2	--

Table 1 - Rut Avoidance Mix Composition

Subsection 401-2.03A Coarse Aggregate and 401.2.03B Blending shall be deleted and replaced with the following:

1. Coarse Aggregates. Top Course Type 6F RA Type 7F RA asphalt concrete

mixtures shall be from approved sources and shall meet one of the following requirements.

a. Coarse aggregates shall be crushed limestone having an acid insoluble residue content of not less than 20%, excluding particles of chert and similar siliceous rocks.

b. Coarse aggregates shall be crushed dolomite having an acid insoluble residue content of not less than 17%, excluding particles of chert and similar siliceous rocks.

c.. Coarse aggregates shall be blends of two or more of the following types of materials: crushed limestone, dolomite, or granite. These aggregates must meet the following requirements:

For Type 6F RA mixes - not less than 20% (by weight with adjustments to equivalent volumes for materials of different specific gravities) of total coarse aggregate particles (plus 3.2 mm material) shall be non-carbonate. In addition, not less than 20% of the plus 6.3 mm particles shall be non-carbonate. Non-carbonate particles are defined as those having an acid insoluble residue content not less than 80%

For Type 7F RA mixes - not less than 20% (by weight with adjustment to equivalent volumes for materials of different specific gravities) of the total coarse aggregate particles (plus 3.2 mm material) shall be non-carbonate. Non-carbonate particles are defined as those having an acid insoluble residue content not less than 80%.

2. Blending. Where coarse aggregates for these mixtures are from more than one source or of more than one type of material, they shall be proportioned and blended to provide a uniform mixture.

3. Mix Properties. The mixtures shall meet the Marshall property criteria appearing in Table 2 - Marshall Mix Property Criteria.

	Mix Criteria		
Mix Property	Type 3RA	Type 6FRA	Type 7FRA
Stability, N, min.	6700	6700	6700
Flow, 0.25 mm, min.	8	8	8
Marshall Quotient, (Stability/Flow), min.	670	670	670
Air Voids, percent	3.0-5.0	3.0-5.0	3.0-5.0
Void in Mineral Agg. (VMA), percent min.	12.0	14.0	16.0
Voids Filled with Asphalt			

(VFA), percent	65-75	65-75	65-75

Table 2 - Marshall Mix Property Criteria

4. Mix Preparation. The Marshall specimens shall be prepared, mix properties determined, and completed mix design submitted in accordance with the procedures outlined by Department written instructions with the following modifications:

   a. Compactive effort shall be 75 blows per side.

   b. Five point asphalt cement content Marshall design is required prior to production. One point designs are not acceptable.

   c. The minimum specified VMA shall be met at each of the five mix design asphalt cement contents.

   d. The Marshall quotient is calculated as the corresponding ratio of corrected stability (N) to flow (0.25 mm).

   e. The optimum asphalt cement content shall be determined by the "Range" method. Graphs shall be constructed for each of the specified mix design properties (stability, Marshall quotient, air voids, VMA, and VFA) using each property as the vertical axis and percent asphalt cement content as the horizontal axis. The plotted values in each graph shall be fitted with a smooth curve that obtains the "best fit" for all values. A vertical line is drawn at the point where the asphalt cement provides the acceptable lower and upper limits for the properties of stability, flow, Marshall quotient, and air voids. The mid-point of the common overlap is the optimum asphalt cement content provided it does not fall on the positive slope of the VMA curve. When this occurs the low point of the VMA curve shall be the optimum asphalt cement content provided it falls within the common overlap of the specified stability, flow, Marshall quotient, and air voids ranges.

CONSTRUCTION DETAILS

The provisions of §401-3 Construction Details shall apply.

METHOD OF MEASUREMENT

The provisions of §401-4 Method of Measurement shall apply.

BASIS OF PAYMENT

The provisions of §401-5 Basis of Payment shall apply.

Payment will be made under:

Item No.	**Item**	**Pay Unit**
403.1335M	Rut Avoidance Asphalt Concrete, Type 3 RA	MT
403.1735M	Rut Avoidance Asphalt Concrete, Type 6F RA	MT
403.1935M	Rut Avoidance Asphalt Concrete, Type 7F RA	MT